

Stage 1 Physics

Practical Investigation: Free Design

The aim of this task is to investigate the effect of one factor on some result. Both the independent and dependent variables need to be quantifiable (numerical) so that the results are appropriate for plotting on a scatter graph with a line of best fit.

Phase 1: Deconstruction and Design

- Choose a dependent variable (the result you're going to measure)
- For each factor that could affect the dependent variable:
 - Explain the effect the factor would have, including relevant Physics
 - Describe how, if at all, the factor could be measured
 - Describe the extent to which the factor could be controlled
 - Hence evaluate whether the factor would be a good choice for independent variable
- Choose an independent variable (the factor you're going to change)
- Write a hypothesis describing the effect changing the independent variable will have on the dependent variable. Explain all reasoning, including any initial research.
- Describe at least two possible ways the experiment could be carried out, explaining possible difficulties.
- Write a list of the equipment needed to carry out the experiment.
- Write a method. It should be clear, numbered, and step-by-step, and include a diagram.
- Write or annotate reasons for decisions you made when planning each step in the method.
- Draw up a results table. This will be filled in as the experiment is performed.
- Hand in the design for marking.

Perform the investigation, recording results and any observations.

Phase 2: Report

- Method Implemented
 - This may be different from your original design. If it is, include reasons for any changes.
- Results
 - Plot a clearly labelled graph of the results, including a line of best fit.
- Calculations
 - Perform any calculations necessary to get the data into a form that could be used to support the hypothesis.
- Discussion
 - Reliability and possible sources of random error (compared with evidence from data).
 - Accuracy and possible sources of systematic error (compared with evidence from data).
 - Validity and potential limitations (with evaluation of the experimental procedure).
- Conclusion
 - Formulate a relevant conclusion based on the hypothesis, and summarise key points from the Discussion section that are particularly relevant to the conclusion.

